ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service

Available Online at:www.ijdsir.com

Volume – 9, Issue – 2, March – 2026, Page No. : 14 – 20

Paradental Cyst – A Rare Case Report and Review of Literature

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Citation of this Article: Dr. Sudipa Ghosh, Dr. Ranjani Shetty, Dr. Shivprasad S, Dr. Ashok L., "Paradental Cyst – A Rare Case Report and Review of Literature", IJDSIR- March – 2026, Volume – 9, Issue – 2, P. No. 14 – 20.

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Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

The paradental cyst is an inflammatory odontogenic lesion that, except for recurrent acute episodes, shows few clinical signs and symptoms. While the microscopic results are the same as those of odontogenic inflammatory cysts, this cyst has distinctive clinical and radiological features. Insufficient clinical information frequently results in the non-recording of inflammatory paradental cysts (IPC). We report a case of a 42-year-old man who had an odontogenic cyst discovered accidentally on radiograph, although a clinical intraoral examination showed an asymptomatic tooth that was half-erupted and free of caries. The radiograph shows a well-defined radiolucency surrounding the mandibular third molar's distal surface. An odontogenic epithelium with an inflammatory connective tissue wall was discovered by histopathological analysis. In accordance with the radiological and clinical findings, a paradental cyst was identified. The significance of radiological and clinical correlation for the diagnosis of paradental cyst is discussed in this case report. Misunderstanding this lesion may result in issues with diagnosis and treatment. The purpose of this article is to report a case of Paradental Cyst in order to better comprehend this cyst.

Keywords: Paradental cyst, Incidental, Well-circumscribed radiolucency, Odontogenic inflammatory cyst.

Introduction

"A cyst that develops as a result of an inflammatory process in the periodontal pocket near the cervical margin of the lateral aspect of a root" is the definition of a paradental cyst [1]. Hofarth et al. described many cases of ("marginal wisdom tooth cyst,") jaw cysts distal to the mandibular third molars with pericoronitis symptoms in 1930. Craig et al. then proposed the term "paradental cyst" in 1976. According to Slater, eruption pocket cysts or eruption cysts related to pericoronitis can more effectively showcase the cyst's clinical characteristics,

which are closely linked to tooth growth. Craig reported that 4.7% of 1051 odontogenic cysts were paradental cysts[2].

Paradental cysts are often misdiagnosed due to various names, clinical, radiological and histological similarities with other entities, making diagnosis and treatment more challenging. This article's goal is to report on one such exceptional occurrence.

Case Description

The chief complaint of a male patient aged 42 years consulted in the Oral Medicine and Radiology Department, was that he had pain and food accumulation in the upper right molar area. Pain in the affected region for 2 months was gradual in onset, throbbing type, and mild intensity, worsens when chewing food and recurs on its own. There was no history of allergies to medications or chronic illnesses of medical importance and no family history that is pertinent. No history of negative habits was reported. The patient had no signs of pallor, jaundice-cyanosis, or clubbing during general examination. He was averagely built and well-fed. The patient had no fever, an 80 beats per minute pulse, 17 cycles per minute respiration, and 120/80mmHg blood pressure. Extraoral examination revealed no obvious facial asymmetry. Bilateral submandibular lymph nodes were spherical, tiny, smooth, soft, non-tender, and mobile when palpated. On temporomandibular joint examination there was no mandibular deviation, no tenderness and no clicking or crepitus sound. The mouth opening was normal. The masticatory, reflective and specialized mucosa seemed normal upon intraoral inspection. Miller's class I gingival recession, which is characterized by soft and oedematous marginal gingiva in relation to 15, 16, and 17 region was noted. Except 28, the permanent dentition's usual complement was present with partially erupted 38,48. 37 showed occlusal deep dental caries, with generalized mild to moderate abrasions, calculus, and general brownish discolouration. Regarding 15,16,17, a tentative diagnosis of chronic localized periodontitis and generalized gingivitis was considered. (Figure 1A, 1B) The haematological analysis, revealed all parameters within normal limits. On radiographic investigation, Orthopantomogram (Figure 2) revealed an incidental finding of a solitary radiolucency in the right ramus of the mandible antero-posteriorly extending from the disto-coronal surface of the 48 to the mid ramus region of the right mandible, and super inferiorly from the external oblique ridge to the superior border of the mandibular canal, about 3X4 cm in size. Irregular shape, well-defined border with thin cortication and cone beam computed tomography (Figure 3) shows a single osteolytic expansile lesion of size (23.9 x 11.4 x 15.6) mm in the posterior aspect of the right mandible, seen on the distal surface of 48, which ends at the level of the Cemento-enamel junction of 48 causing discontinuity at the upper edge of the canal of the inferior alveolar nerve, and thinned out lingual cortical plate. A benign odontogenic lesion-odontogenic Keratocyst, Unicystic ameloblastoma, paradental cyst, and lateral dentigerous cyst were considered as differential diagnoses in the 48 region, distally impacted 28 with roots are in close proximity to floor of left maxillary sinus was present, distally tilted 38 with pericoronal radiolucency of size 5.2x4.4 mm, suggestive of chronic pericoronal abscess was evident. Enucleation of the cystic lesion in relation to 48 with peripheral osteotomy and extraction of 48 and 38 was done under general anaesthesia (Figure 4).

Microscopic evaluation of the cyst shows the presence of epithelium and underlying connective tissue. The lining epithelium is of the nonkeratinized, stratified squamous type and has variable thickness. The connective tissue wall is of the fibro-cellular type and consists of collagen

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fibers interspersed with fibroblasts and plasma cells, as well as numerous dilated blood capillaries, diagnosed as a paradental cyst i.r.t 48.

Discussion

Among all odontogenic cysts, the prevalence of Paradental Cyst (PC) ranges from 1% to 5% [3]. Its inclusion in the category of uncommon lesions is justified by this feature. Pericoronitis, lateral radicular cyst, dentigerous cyst, or other lesions associated with inflammatory disorders of the dental follicle are thought to have been misdiagnosed as PC. To be clear, the term "Buccal Bifurcation Cyst" (BBC) is more frequently used to describe the buccal side of children's first and second mandibular molars, whereas the term "classic Paradental Cyst" refers to the third molar. Since the Classic Paradental Cyst and BBC may have similar microscopic characteristics and a comparable etiology, they are presently thought to be the same inflammatory cyst that appears in several sites. [4]

The WHO named it the "Mandibular Infected Buccal Cyst" and classed it as an odontogenic tumor [1]. Inflammatory Collateral Cyst, Craig's Cyst, Mandibular Infected Buccal Cyst-Molar Area, Inflammatory Lateral Periodontal Cyst, Inflammatory Cyst, Buccal Bifurcation Cyst, Cystis Paradentalis, Eruption Pock Cyst, and Hofrath's Cyst are just a few of the other terms that have been used over the years.

Etiologic factors, pathophysiology and several explanations have been put up to explain the unclear genesis of paradental cysts. i) Eruption Factor: When the Mesio-buccal cusp pierces the oral epithelium during tooth eruption, connective tissue epithelial adhesion may produce inflammation and stimulate epithelial development. Clinically, a BBC is frequently detected after eruption because the inflammation only has a pathway to enter the periodontal pocket when a tooth is partially or completely erupted[5]. ii) Dental Anatomy Factors: The cervical enamel projection (CEP) is rare in single-rooted teeth and ranges from 8.3% to 85.1% in mandibular molars. Since CEPs cannot be attached to connective tissues, they have been linked to an increased risk of developing localized periodontitis [4,5]. During eruption, the gingiva at the CEP is vulnerable to the buildup of bacterial plaque and the formation of inflammatory lesions. iii) Food Impaction: According to Colgan et al., food impaction may be the primary cause of PCs in third molars. This condition results in inflamed gingiva and exudate build up in the enlarged operculum, which causes cystic dilatation by inducing epithelial development. The way food flows depends on the third molar's development. It is common for cysts to occur in the mandibular first and second teeth that erupted at an abnormal angle [6]. iv)Epithelial genesis: Potential origins include the sulcular epithelium, decreased enamel epithelium or Malassez cell remains. The root surface should also be uniformly encased by the Paradental Cyst lining if the Malassez is the epithelial origin. The diminished enamel epithelium appears more squamous during tooth eruption, and this look intensifies if eruption is inhibited. v) Immunological Factors: Inflammation causes the release of cytokines (IL-1, IL-6, and TNF-α). These draw in immune cells, which start the osteoclastic process. The buccal cortical plate is usually impacted by bone loss without the tooth roots being harmed [7].

The most common signs and symptoms are increased volume, pain and suppuration, with the patient occasionally complaining of sensitivity in the region, delayed tooth eruption and even facial asymmetry.

Regardless of gender or ethnicity, mandibular third molar paradental cysts typically develop in the third decade of life, after adulthood. However, vestibular bone expansion is definitely the most significant clinical finding,

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representing an important signal for the diagnosis of a paradental cyst in the first and second lower molar. Ozcan and Prakash found an unusual PC in supernumerary teeth united with the mandibular third molar. It's possible that the existence of an extra tooth prevented full eruption, which led to the formation of cysts [8,9].

For routine examinations, panoramic and apical radiographs are frequently utilized, which can first identify the existence of a paradental cyst or BBC. It can reach across the mesial and distal roots in a lateral direction and extend to the inferior border of the mandible in a vertical direction. The displacement of the molar, periosteal response and buccal bone expansion can all be seen on a cross-sectional mandibular occlusal radiograph. Cone Beam Computerized Tomography, which produces high-resolution and three-dimensional images, has significantly influenced maxillofacial imaging and is widely employed. Paradental cyst diagnosis and treatment have been found to benefit greatly from CBCT. 3D reconstruction of the jaw helps with accurate diagnosis and treatment by highlighting the findings and the relationship between the lesion and the surrounding structures.[4] Derindag et al. additionally suggested that non-ionizing ultrasonography (USG) with an intraoral probe may help diagnose BBC if a cyst causes buccal cortical bone perforation and soft tissue enlargement[10].The boundaries of the mandibular third molar paradental cyst were more pronounced than those of the BBC. It is typically located on the third molar's distal or distobuccal side. It occasionally exhibits semilunar radiolucency on top of the roots. Their diameter was typically between 10 and 15 mm. Both the lamina dura and the periodontal ligament are continuous. Furthermore, the preservation of the area surrounding the dental follicle, known as Colgan's sign, was occasionally seen and was thought to be a crucial diagnostic indication that the dental follicle was not implicated in the formation of the paradental cyst [1,6].

According to the WHO standards, the Paradental cyst's cystic radiolucency extended at least 4 mm beyond the tooth's follicular space [11].

Possible differential diagnoses for this disorder include ameloblastoma, odontogenic fibroma, odontogenic Keratocyst, eruption cyst, periodontal abscess, gingival cyst, pericoronitis, hyperplastic dental follicle, lateral radicular cyst, and dentigerous cyst. The clinical and imaging features of dentigerous cyst and lateral radicular cyst are similar to those of paradental cyst. A paradental cyst originates on the lateral crown of an erupted or partially erupted tooth, while a dentigerous cyst is radiolucent around the crown of an unerupted tooth. Because buccal enlargement and the lingual tilting of the apexes could be seen across various sections in PC rather than dentigerous cyst Bautista et al. considered CBCT to be a valuable tool [6]. One crucial diagnostic criterion is a vitality test of the tooth. In cases of tooth discolouration or painful percussion without a deep periodontal pocket, a radicular cyst would be the first thing to be considered. Vitality testing and imaging analysis are of great importance. [11]

Paradental Cysts are categorized as inflammatory odontogenic cysts, and they resemble radicular cysts in their nonspecific inflammatory presentation. Paradental cysts originating from other teeth, like the posterior first and second molars, can show similar histopathological characteristics of PCs of the mandibular third molars. The fundamental part of the cyst wall varies in thickness and is affixed to granulation tissue that lines up with the region of the periodontal ligament. Vascular expansion, hemosiderin pigment, cholesterol crystal fissures, and occasionally foreign body giant cell reactions are caused

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by a significant number of chronic or mixed inflammatory cells that penetrate the cyst wall's connective tissue[11]. Immunohistochemistry was also utilized by Maruyama et al. UEA-I binding, perlecan, and K13, K14, and K19 found to be positive in the lining epithelia of PCs from the mandibular third molars. This was in contrast to the radicular cyst and dentigerous cyst[12].

Enucleation of the paradental cyst with tooth extraction is the recommended treatment for third molars, and this is what is done in this instance. The most popular method is to extract the third molar teeth together with the curettage of the paradental cyst because it is typically not worth retaining. [13]

Conservative treatments include minimally invasive pocket draining and sustained release of 10% doxycycline hydrochloride gel relieved pain and swelling quickly (J. Pelka et al.). There was no need for topical antibiotic treatment after that [5].

Conclusion

To make a final diagnosis, the clinical, radiographic, and histologic results must be properly correlated due to the rare occurrence of the mandibular molars' relationship with the paradental cyst and its unique clinical aspect of an incidental finding, as in the instance mentioned above. Both the paradental and buccal bifurcation cysts have the same etiology and histologic characteristics, but they present differently clinically and radiologically. This variation in localization may determine the appropriate course of treatment, and it can be linked to the different teeth involved and the ages at which these teeth erupt. When the affected tooth is a third molar, surgical extraction of both the tooth and the cyst has been thought to be the best course of action. When the first or second molars are affected, it is advised to enucleate the lesion while maintaining the surrounding tooth in order to protect the permanent tooth.

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Legend Figures:

Figure 1A: Right side of the Oral Cavity

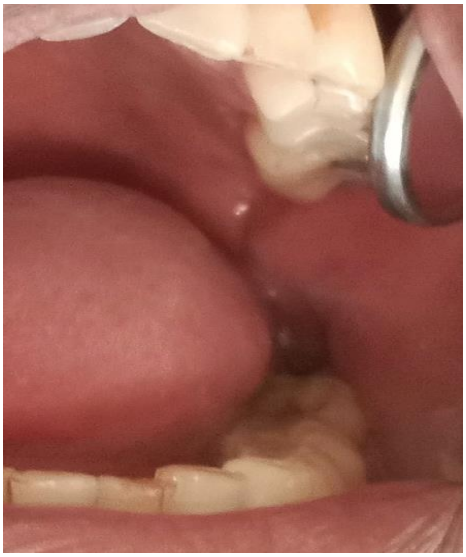

Figure 1B: Left side of the Oral Cavity

Figure 2: Orthopantomogram showing a solitary radiolucency in the right ramus of the mandible.

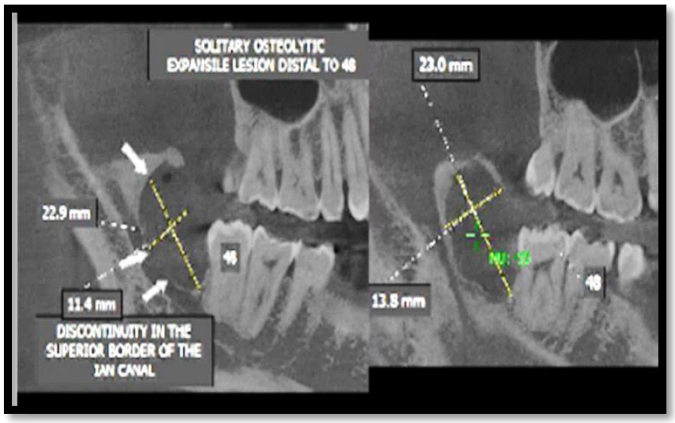

Figure 3: CBCT-Sagittal Section showing a single osteolytic seen on the distal surface of 48.

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Figure 4: Post-operative OPG- Enucleation of the cystic lesion in relation to 48 with peripheral osteotomy and extraction of 48 and 38 was done under general anaesthesia.

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